Claims:

1. An isolated nucleic acid molecule encoding a hyperimmune serum reactive antigen or a fragment thereof comprising a nucleic acid sequence which is selected from the group consisting of:
   a) a nucleic acid molecule having at least 70% sequence identity to a nucleic acid molecule selected from **Seq ID No** 3-4, 16, 19-21, 28-29, 33-38, 41-42, 44, 48-52, 55, 57-58, 61, 63, 65, 67-68, 72, 74-75, 81, 84, 91, 94, 96-97, 101, 105-108, 112, 115-117, 119, 123-178,
   b) a nucleic acid molecule which is complementary to the nucleic acid molecule of a),
   c) a nucleic acid molecule comprising at least 15 sequential bases of the nucleic acid molecule of a) or b)
   d) a nucleic acid molecule which anneals under stringent hybridisation conditions to the nucleic acid molecule of a), b), or c)
   e) a nucleic acid molecule which, but for the degeneracy of the genetic code, would hybridise to the nucleic acid molecule defined in a), b), c) or d).

2. The isolated nucleic acid molecule according to claim 1, wherein the sequence identity is at least 80%, preferably at least 95%, especially 100%.

3. An isolated nucleic acid molecule encoding a hyperimmune serum reactive antigen or a fragment thereof comprising a nucleic acid sequence selected from the group consisting of
   a) a nucleic acid molecule having at least 96% sequence identity to a nucleic acid molecule selected from **Seq ID No** 8-10, 13-15, 17-18, 24, 27, 32, 39-40, 45-47, 56, 59, 62, 69-70, 73, 77, 79, 82, 85-86, 88, 90, 103, 109-110, 114, 121.
   b) a nucleic acid molecule which is complementary to the nucleic acid molecule of a),
   c) a nucleic acid molecule comprising at least 15 sequential bases of the nucleic acid molecule of a) or b)
   d) a nucleic acid molecule which anneals under stringent hybridisation conditions to the nucleic acid molecule of a), b) or c),
   e) a nucleic acid molecule which, but for the degeneracy of the genetic code, would hybridise to the nucleic acid defined in a), b), c) or d).

4. An isolated nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of
   a) a nucleic acid molecule selected from **Seq ID No** 5, 7, 30-31, 53, 60, 66, 76, 83, 87, 92, 99, 120,
   b) a nucleic acid molecule which is complementary to the nucleic acid of a),
   c) a nucleic acid molecule which, but for the degeneracy of the genetic code, would hybridise to the nucleic acid defined in a), b), c) or d).

5. The nucleic acid molecule according to any one of the claims 1, 2, 3 or 4, wherein the nucleic acid is DNA.

6. The nucleic acid molecule according to any one of the claims 1,2, 3, 4, or 5 wherein the nucleic acid is RNA.

7. An isolated nucleic acid molecule according to any one of claims 1 to 5, wherein the nucleic acid molecule is isolated from a genomic DNA, especially from a *H. pylori* genomic DNA.

8. A vector comprising a nucleic acid molecule according to any one of claims 1 to 7.

9. A vector according to claim 8, wherein the vector is adapted for recombinant expression of the hyperimmune serum reactive antigens or fragment thereof encoded by the nucleic acid molecule according to any one of claims 1 to 7.

10. A host cell comprising the vector according to claim 8 or 9.

11. A hyperimmune serum-reactive antigen comprising an amino acid sequence being encoded by a nucleic acid molecule according to any one of the claims 1, 2, 5, 6 or 7 and fragments thereof, wherein the amino acid sequence is selected from the group consisting of **Seq ID No** 181-182, 194, 197-199, 206-207, 211-216, 219-220, 222, 226-230, 233, 235-236, 239, 241, 243, 245-246, 250, 252-253, 259, 262, 269, 272, 274-275, 279, 283-286, 290, 293-295, 297, 301-356.

12. A hyperimmune serum-reactive antigen comprising an amino acid sequence being encoded by a nucleic acid molecule according to any one of the claims 3, 5, 6, or 7 and fragments thereof, wherein the amino acid sueqnece is selected from the group consisting of **Seq ID No** 186-188, 191-193, 195-196, 202, 205, 210, 217-218, 223-225, 234, 237, 240, 247-248, 251, 255, 257, 260, 263-264, 266, 268, 281, 287-288, 292, 299.

13. A hyperimmune serum-reactive antigen comprising an amino acid sequence being encoded by a nucleic acid molecule according to any one of the claims 4, 5, 6, or 7 and fragments thereof, wherein the amino acid sequence is selected from the group consisting of **Seq ID No** 183, 185, 208-209, 231, 238, 244, 254, 261, 265, 270, 277, 298.

14. Fragments of hyperimmune serum-reactive antigens selected from the group consisting of peptides comprising amino acid sequences of column "predicted immunogenic aa" and "location of identified immunogenic region" of Table 1, the serum reactive epitope of Table 3 especially peptides comprising amino acid 63-91, 95-101, 110-116, 134-148, 150-156, 158-164, 188-193, 197-209, 226-241, 247-254, 291-297, 312-319, 338-346, 351-358, 366-378, 404-410, 420-438, 448-454, 465-473, 482-488, 490-498, 503-510, 512-519, 531-543, 547-554, 568-575, 589-604, 610-631 and 239-308 of **Seq ID No** 179; 16-29, 35-47, 50-68, 70-79, 91-101, 143-149, 158-163, 185-191, 196-206, 215-224, 230-237, 244-251, 258-278, 290-311, 319-325, 338-351, 365-385, 396-429, 445-454, 458-466, 491-499, 501-521, 17-79 and 218-233 of **Seq ID No** 180; 4-10, 16-41, 46-66, 77-84, 91-97, 102-118, 125-144, 187-200, 202-214, 245-253, 255-261, 286-295, 300-330, 335-342, 350-361, 363-381, 385-392, 396-416, 435-450 and 460-470 of **Seq ID No** 181; 11-19, 27-48, 52-59, 77-82, 84-107, 118-125, 127-154, 178-183, 192-209, 215-221, 286-295, 302-313, 350-357, 402-415, 417-431, 453-463, 465-493 and 313-331 of **Seq ID No** 182; 19-26, 30-43, 47-55, 63-68, 72-80, 97-104, 107-119, 129-146, 160-175, 194-216, 231-251, 254-260 and 26-43 of **Seq ID No** 183; 7-13, 29-37, 65-81, 110-120, 123-131, 135-152, 230-249, 254-260, 284-290, 292-299, 317-326, 329-336, 403-444, 452-458, 466-477, 490-498, 510-519, 541-550, 557-566 and 533-567 of **Seq ID No** 184; 5-47, 71-77, 79-86, 89-95, 120-126, 137-144, 176-181, 184-196, 202-208, 211-232, 236-282, 301-313, 317-325, 341-347, 353-384, 394-400, 412-433, 436-443 and 59-75 of **Seq ID No** 185; 4-18, 22-38, 59-69, 106-112, 116-130, 138-149, 156-170, 175-197, 200-214, 216-223, 233-244, 255-261, 266-276, 279-286, 325-333, 342-348, 366-399, 402-420, 429-441, 1-104 and 130-147 of **Seq ID No** 186; 50-58, 69-95, 97-113, 131-136, 157-163, 170-175, 188-212, 220-226, 254-259, 265-277, 283-289, 297-308, 311-318, 347-358, 360-369, 378-401, 416-421, 440-450, 454-462, 470-476, 493-502, 506-514, 536-567, 585-590, 598-607, 613-618, 653-659 and 35-46 of **Seq ID No** 187; 16-29, 32-60, 65-87, 89-123, 128-134, 137-158, 162-173, 178-196, 210-216, 218-228 and 206-225 of **Seq ID No** 188; 10-20, 26-35, 51-64, 86-91, 94-100, 113-122, 154-160, 185-191, 193-201, 211-217, 225-230, 237-246, 251-257, 298-304, 306-312, 316-328, 340-348, 357-389, 391-397, 415-421, 449-456, 458-471, 488-495, 502-511, 24-55 and 236-341 of **Seq ID No** 189; 5-22, 41-51, 87-93, 114-122, 127-136, 150-156, 158-166, 223-233, 245-263, 291-296, 9-126 and 127-285 of **Seq ID No** 190; 30-43, 46-56, 61-70, 72-83, 85-93, 103-113, 119-125, 151-166, 179-191, 212-218, 225-231, 236-243, 262-267, 291-307, 331-344, 349-355, 366-372, 380-386, 414-422, 428-447, 459-464, 469-478, 507-519, 525-544, 563-569, 576-590, 620-626, 633-643, 654-659, 665-671, 684-707, 717-723, 725-733, 747-779, 782-801 and 347-361 of **Seq ID No** 191; 4-12, 14-26, 37-80, 107-115, 133-139, 144-150, 154-165, 173-180, 191-199, 205-211, 221-231, 237-244, 254-284, 307-340, 342-353, 360-368, 370-380, 479-493, 495-503,

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6-15, 18-28, 58-66, 84-101, 106-129, 136-151, 154-165, 182-203, 205-211, 214-220, 222-228, 233-240, 251-260, 270-277, 284-291, 306-315, 322-328, 363-369, 378-388, 392-405, 443-452, 495-501, 512-523, 574-583 and 362-375 of **Seq ID No** 221; 5-25, 27-34, 47-59, 64-70, 76-86, 145-158, 166-183, 189-202, 217-231, 235-242, 260-270, 278-309 and 1-102 of **Seq ID No** 222; 4-19, 24-76, 78-83, 90-99, 102-109, 114-122, 137-147, 154-174, 177-188, 203-212, 217-223, 227-239 and 226-325 of **Seq ID No** 223; 7-37, 71-90, 94-109, 117-128, 141-153, 179-192, 199-206, 225-231, 237-243, 258-264 and 40-51 of **Seq ID No**224; 13-19, 25-30, 46-59, 75-91, 101-107, 114-124, 129-135, 137-145, 160-167, 171-179, 187-194, 209-215, 217-222, 229-239, 243-249, 257-265, 269-275, 299-308, 310-327 and 282-300 of **Seq ID No** 225; 86-100, 216-230, 342-369, 382-388, 424-430, 438-445, 452-458, 488-494, 501-518, 554-560, 568-574, 584-592, 603-609, 611-629, 639-645, 652-661, 669-699, 708-714, 726-738, 747-753, 763-775, 785-791, 794-807, 815-824, 826-845, 854-860, 863-868, 870-883, 892-898, 901-906, 909-921, 930-937, 946-959, 968-974, 977-990, 998-1007, 1009-1027, 1037-1043, 1046-1051, 1053-1066, 1075-1081, 1084-1089, 1092-1103, 1113-1119, 1122-1135, 1143-1152, 1154-1172, 1182-1188, 1191-1196, 1200-1210, 1220-1226, 1229-1235, 1237-1249, 1259-1265, 1268-1281, 1289-1298, 1305-1318, 1328-1334, 1337-1343, 1345-1357, 1367-1373, 1390-1396, 1405-1411, 1418-1423, 1426-1435, 1445-1455, 1474-1483, 1493-1500, 1505-1512, 1517-1524, 1538-1544, 1568-1578, 1595-1601, 1674-1682, 1687-1720, 1728-1736, 1738-1744, 1754-1761, 1764-1774, 1798-1824, 1836-1842, 1886-1893, 1895-1903, 366-781, 782-1518 and 1731-1747 of **Seq ID No** 226; 4-17, 20-39, 46-55, 60-66, 102-110, 114-122, 125-131, 161-167, 172-178, 185-190, 195-202, 218-232, 236-252, 264-291, 293-302, 309-315, 324-339 and 169-381 of **Seq ID No** 227; 5-10, 13-40, 42-53, 69-75, 83-89, 120-135, 150-161, 174-190, 203-225, 229-247, 257-287, 318-348 and 30-200 of **Seq ID No** 228; 7-19, 43-53, 64-72, 124-139, 52-84 and 120-131 of **Seq ID No** 229; 12-19, 39-48, 58-100, 117-123, 154-162, 164-187, 189-195, 202-216, 218-235, 241-246, 262-278, 315-328, 333-347, 354-366, 372-379, 391-405, 422-429, 431-442, 444-450, 458-466, 478-485, 494-501, 504-510, 520-535, 573-580, 589-598, 615-625, 666-676, 686-698, 722-729, 737-746, 756-767, 787-796, 805-816, 824-829, 833-848, 856-864, 866-876, 879-886, 898-904, 918-924, 927-934, 941-960, 967-978 and 561-575 of **Seq ID No** 230; 11-29, 49-55, 70-77, 84-100, 102-112, 148-155, 160-177, 181-204 and 1-104 of **Seq ID No** 231; 27-44, 64-71, 122-133, 151-156, 164-178, 214-220, 226-232, 235-244, 253-262, 282-288, 294-310, 317-325, 350-356, 362-368, 376-383, 438-443, 449-454, 459-464, 492-498, 500-511, 529-535, 538-546, 567-573, 597-603, 660-665, 674-679, 724-734, 763-769, 773-784, 791-801, 807-815, 821-826, 840-848, 863-868, 897-902, 908-928, 932-953, 956-975, 980-987, 990-996, 1012-1018, 1042-1063, 1095-1116, 1149-1157, 1160-1167, 110-357, 358-501 and 502-1161 of **Seq ID No** 232; 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15. A process for producing a *H. pylori* hyperimmune serum reactive antigen or a fragment thereof according to any one of the claims 11 to 14 comprising expressing the nucleic acid molecule according to any one of claims 1 to 7.

16. A process for producing a cell, which expresses a *H. pylori* hyperimmune serum reactive antigen or a fragment thereof according to any one of the claims 11 to 14 comprising transforming or transfecting a suitable host cell with the vector according to claim 8 or claim 9.

17. A pharmaceutical composition, especially a vaccine, comprising a hyperimmune serum-reactive antigen or a fragment thereof, as defined in any one of claims 11 to 14 or a nucleic acid molecule according to any one of claims 1 to 7.

18. A pharmaceutical composition, especially a vaccine, according to claim 17, characterized in that it further comprises an immunostimulatory substance, preferably selected from the group comprising polycationic polymers, especially polycationic peptides, immunostimulatory deoxynucleotides (ODNs), peptides containing at least two LysLeuLys motifs, neuroactive compounds, especially human growth hormone, alumn, Freund's complete or incomplete

adjuvants or combinations thereof.

19. Use of a nucleic acid molecule according to any one of claims 1 to 7 or a hyperimmune serum-reactive antigen or fragment thereof according to any one of claims 11 to 14 for the manufacture of a pharmaceutical preparation, especially for the manufacture of a vaccine against *H. pylori* infection.

20. An antibody, or at least an effective part thereof, which binds at least to a selective part of the hyperimmune serum-reactive antigen or a fragment thereof according to any one of claims 11 to 14.

21. An antibody according to claim 20, wherein the antibody is a monoclonal antibody.

22. An antibody according to claim 20 or 21, wherein said effective part comprises Fab fragments.

23. An antibody according to any one of claims 20 to 22, wherein the antibody is a chimeric antibody.

24. An antibody according to any one of claims 20 to 23, wherein the antibody is a humanized antibody.

25. A hybridoma cell line, which produces an antibody according to any one of claims 20 to 24.

26. A method for producing an antibody according to claim 20, characterized by the following steps:
- initiating an immune response in a non-human animal by administrating an hyperimmune serum-reactive antigen or a fragment thereof, as defined in any one of the claims 11 to 14, to said animal,
- removing an antibody containing body fluid from said animal, and
- producing the antibody by subjecting said antibody containing body fluid to further purification steps.

27. Method for producing an antibody according to claim 21, characterized by the following steps:
- initiating an immune response in a non-human animal by administrating an hyperimmune serum-reactive antigen or a fragment thereof, as defined in any one of the claims 12 to 15, to said animal,
- removing the spleen or spleen cells from said animal,
- producing hybridoma cells of said spleen or spleen cells,
- selecting and cloning hybridoma cells specific for said hyperimmune serum-reactive antigens or a fragment thereof,
- producing the antibody by cultivation of said cloned hybridoma cells and optionally further purification steps.

28. Use of the antibodies according to any one of claims 20 to 24 for the preparation of a medicament for treating or preventing *H. pylori* infections.

29. An antagonist which binds to the hyperimmune serum-reactive antigen or a fragment thereof according to any one of claims 11 to 14.

30. A method for identifying an antagonist capable of binding to the hyperimmune serum-reactive antigen or fragment thereof according to any one of claims 11 to 14 comprising:
a) contacting an isolated or immobilized hyperimmune serum-reactive antigen or a fragment thereof according to any one of claims 11 to 14 with a candidate antagonist under conditions to permit binding of said candidate antagonist to said hyperimmune serum-reactive antigen or

fragment, in the presence of a component capable of providing a detectable signal in response to the binding of the candidate antagonist to said hyperimmune serum reactive antigen or fragment thereof; and

b) detecting the presence or absence of a signal generated in response to the binding of the antagonist to the hyperimmune serum reactive antigen or the fragment thereof.

31. A method for identifying an antagonist capable of reducing or inhibiting the interaction activity of a hyperimmune serum-reactive antigen or a fragment thereof according to any one of claims 11 to 14 to its interaction partner comprising:

a) providing a hyperimmune serum reactive antigen or a hyperimmune fragment thereof according to any one of claims 11-14,
b) providing an interaction partner to said hyperimmune serum reactive antigen or a fragment thereof, especially an antibody according to any one of the claims 20 to 24,
c) allowing interaction of said hyperimmune serum reactive antigen or fragment thereof to said interaction partner to form a interaction complex,
d) providing a candidate antagonist,
e) allowing a competition reaction to occur between the candidate antagonist and the interaction complex,
f) determining whether the candidate antagonist inhibits or reduces the interaction activities of the hyperimmune serum reactive antigen or the fragment thereof with the interaction partner.

32. Use of any of the hyperimmune serum reactive antigen or fragment thereof according to any one of claims 11 to 14 for the isolation and/or purification and/or identification of an interaction partner of said hyperimmune serum reactive antigen or fragment thereof.

33. A process for *in vitro* diagnosing a disease related to expression of the hyperimmune serum-reactive antigen or a fragment thereof according to any one of claims 11 to 14 comprising determining the presence of a nucleic acid sequence encoding said hyperimmune serum reactive antigen and fragment according to any one of claims 1 to 7 or the presence of the hyperimmune serum reactive antigen or fragment thereof according to any one of claims 11-14.

34. A process for *in vitro* diagnosis of a bacterial infection, especially a *H. pylori* infection, comprising analysing for the presence of a nucleic acid sequence encoding said hyperimmune serum reactive antigen and fragment according to any one of claims 1 to 7 or the presence of the hyperimmune serum reactive antigen or fragment thereof according to any one of claims 11 to 14.

35. Use of the hyperimmune serum reactive antigen or fragment thereof according to any one of claims 11 to 14 for the generation of a peptide binding to said hyperimmune serum reactive antigen or fragment thereof, wherein the peptide is selected from the group comprising anticalines.

36. Use of the hyperimmune serum-reactive antigen or fragment thereof according to any one of claims 11 to 14 for the manufacture of a functional nucleic acid, wherein the functional nucleic acid is selected from the group comprising aptamers and spiegelmers.

37. Use of a nucleic acid molecule according to any one of claims 11 to 14 for the manufacture of a functional ribonucleic acid, wherein the functional ribonucleic acid is selected from the group comprising ribozymes, antisense nucleic acids and siRNA.